DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
Interim Final 2/5/99
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)
Current Human Exposures Under Control

Facility Name: USS Taylor Facility
Facility Address: 555 Delwar Road, West Mifflin, PA 15122
Facility EPA ID #: PAD 000 739 672

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

☒ If yes - check here and continue with #2 below.

☐ If no - re-evaluate existing data, or

☐ If data are not available, skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)
Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI
A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies
While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations
EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	Area	Rationale / Key Contaminants
Groundwater	X		South Taylor	Landfills / Manganese, Cyanide, Chromium, Iron
Air (indoors)[2]		X		-No buildings over contamination -No VOC concerns
Surface Soil (e.g., <2 ft)	X		Mid/North Taylor	-Waste Tar Disposal Area / Coal tar -Debris Area / petroleum
Surface Water	X		South Taylor tributary to Streets Run	Manganese
Sediment		X		Seeps collected and treated
Subsurface Soil (e.g., >2 ft)	X		Mid/North Taylor	-Waste Tar Disposal Area / Coal tar -Debris Area / petroleum
Air (outdoors)		X		No VOC concerns

☐ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

☒ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

☐ If unknown (for any media) - skip to #6 and enter "IN" status code.

Background:

The 490-acre property is divided into 2 areas, based on past waste disposal activities: South Taylor and Mid/North Taylor. (Figure 1). Access to the property is restricted by fencing and locking gates.

Mining influences

- The geologic units beneath the site include the Pittsburgh Coal seam, which was mined extensively under and around the site.
- Groundwater beneath the site flows through mine-induced fractures (caused by mine subsidence) into the underlying mine workings (mine pool).
- The mine workings are above the elevation of the local streams (above drainage mine).
- Groundwater eventually discharges as acid-mine drainage seeps.
- PADEP has listed the surface water within and adjacent to the site (South Taylor tributary, North Taylor tributary, and Streets Run) as impaired waters due to metals from abandoned coal mine drainage.
- PADEP removed the potable water supply designation from all surface water in the Streets Run watershed.

South Taylor (Figure 2)

Waste disposal on the 240-acre area includes three adjacent landfill areas that are monitored under PADEP permitting authority:

Hazardous Waste Landfill (closed) – 10.7 acres,
Residual Waste Landfill (inactive/interim closed) – 26.4 acres, and
Old Residual Waste Landfill (ORWL) (closed) – 11 acres

Seepage and leachate are collected from the following areas:

- Residual waste areas – underdrain collection system, surface seepage, and leachate collection system;
- Hazardous waste area – leachate collection system and groundwater recovery wells (A-5R, M-5, and M-12); and
- Acid mine drainage seeps.

Hazardous waste leachate and recovered groundwater are treated at the on-site (NPDES-permitted) treatment plant. Residual waste drainage/leachate and acid mine drainage are combined with the effluent from the hazardous waste treatment plant, then pumped to the USS Irvin Works for treatment and discharge (NPDES permitted).

Mid/North Taylor Area

This 250-acre area was used for waste disposal until the early 1980's, primarily in the 1970's through the early 1980's. Waste disposal areas include:

Closed Landfill, ~ 2 acres
- Operated from February 1981 until January 1982.
- Waste included: Class III demolition waste from steel plants, railroad ties, and drummed waste (oil, grease, and paint sludge).
- The landfill was closed in 1983 in accordance with a PA Consent Agreement. Closure actions included: drum removal, clay cap, vegetated cover, and groundwater monitoring.

Debris/Trash Area – A small quantity of general refuse, possibly including petroleum products (motor oil filters), appears to be dumped on the ground surface.

Steel (Blast Furnace) Slag Disposal Area, ~ 70 acres
- Operated from 1940's until 1977.

Waste Tar Disposal Area, ~ 5 acres
- Operated from 1969 until 1977.
- Waste Tar was mixed with slag and covered with slag and soil.
- Several small areas of hardened tar are visible at the ground surface.

Railroad Tie Disposal Areas, ~ 0.5 acres
- Operated during the 1970's to 1980's
- Waste included: old railroad ties, slag, and general debris

The remaining Mid/North Taylor area is wooded land.

Seep water is collected from the area above the headwaters of the primary drainage feature, the North Taylor tributary to Streets Run, and treated prior to discharge to the North Taylor tributary (NPDES permitted). The treatment system includes neutralization of acid mine drainage with slag, then treatment of the slag discharge through a constructed wetland area.

Rationale:

Groundwater

South Taylor Groundwater - Groundwater is monitored on a quarterly basis in 4 hydrogeologic zones (upper to lower):
Overburden – Series A wells: 4 wells (3 sampled, 1 dry)
Monongahela Formation – Series B wells: 10 wells (5 sampled, 5 dry)
Pittsburgh Coal (mined) – Series M wells: 8 wells (6 sampled, 2 dry)
Conemaugh Formation – Series C wells: 13 wells (8 sampled, 5 dry)

Monitoring data for the 4 quarters in 2016 shows the following exceedances of EPA screening levels:
MCLs: EPA National Primary Drinking Water Maximum Contaminant Level, or
RSL: EPA Regional Screening Level (for contaminants without MCLs).

Contaminant	Screening level	Well	# quarters exceeded	Annual Average Concentration: mg/l	
Manganese	0.43 mg/l RSL for Tap Water	B-13	3	0.55	Below ORWL waste fill
		M-5	4	0.95	Recovery well / Coal mine pillar
		M-6	4	1.05	Down gradient Coal mine pillar
		M-12	4	1.02	Recovery well / Coal mine pillar
Cyanide	0.2 mg/l MCL	A-5R	3	0.72	Recovery well / below ORWL
		HWMH#1	4	1.03	Leachate and seep collection manhole
		M-3R	4	1.43	Down Gradient / Coal mine pillar
		M-12	4	1.44	Recovery well / Coal mine pillar
Chromium	0.1 mg/l, MCL	A-5R	3	0.20	Recovery well / below ORWL
Iron	14 mg/l RSL for Tap Water	M-5	3	25	Recovery well / Coal mine pillar
		M-6	4	18	Down gradient / Coal mine pillar

Several of the groundwater monitoring wells are currently not producing enough water to sample. Under the direction of PADEP, US Steel has recently evaluated the monitoring system. The monitoring system will be upgraded, by well redevelop and/or installation of new wells, to comply with the requirement for 1 upgradient and 3 downgradient wells for each hydrogeologic zone. Should the remediated monitoring system show a change in the nature or area of contamination, this evaluation will be revised accordingly.

Mid/North Taylor Groundwater - Ongoing groundwater contamination is not likely due to the nature of the waste, the length of time that has passed since the disposal activities ceased, and treatment of slag area seeps.

- SVOC and PAH compounds – Low solubility and high soil adsorption gives low potential for contaminants to migrate to groundwater.
- VOCs – Biodegradation over 35 years makes continued migration to the groundwater unlikely.
- Metals – Water from the slag disposal area seeps is collected and treated prior to discharge through an NPDES outfall.

Surface Water

Surface water is monitoring at 5 stream locations. Acid-mine drainage seeps are monitored at 4 locations. Seep water is collected and treated.

In 2016, only manganese was detected above screening levels.

Surface Water	Screening level	Location	# quarters exceeded	Average Concentration: mg/l	
Manganese	0.43 mg/l RSL for Tap Water	STT@SR	3	0.48	South Taylor tributary to Streets Run
		SR-2	2	0.29	Streets Run downstream

Surface and Subsurface Soils

All landfilled waste is covered with an impermeable cap and a vegetative cover, preventing both surface and subsurface exposure. Waste present at the Waste Tar Disposal Area and the Debris/Trash area are not secured with constructed caps. The depth of the waste fill /contamination in these areas is unknown.

Reference:

Results of Investigation, Monitoring Well Evaluation Program Phase I, Hazardous Waste Landfill, South Taylor Environmental Park, Michael Baker International for United States Steel Corporation, January 2017

Results of Investigation, Monitoring Well Evaluation Program Phase I, Residual Waste Landfill, South Taylor Environmental Park, Michael Baker International for United States Steel Corporation, January 2017

South Taylor Environmental Park Technical Information Summary, Michael Baker International for United States Steel Corporation, July 2015

Streets Run Watershed TMDL, Allegheny County, For Abandoned Mine Drainage Affected Segments, PADEP, February 19, 2009

EPA summary of 2016 Quarterly monitoring data, February 2016

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	No	No	No	No	No	No	No
~~Air (indoors)~~	~~----~~	~~----~~	~~----~~	~~----~~	~~----~~	~~----~~	~~----~~
Soil (surface, e.g., <2 ft)	No	No	No	No	No	No	No
Surface Water	No	No	No	No	No	No	No
~~Sediment~~	~~----~~	~~----~~	~~----~~	~~----~~	~~----~~	~~----~~	~~----~~
Soil (subsurface e.g,, >2 ft)	No	No	No	No	No	No	no
~~Air (outdoors)~~	~~----~~	~~----~~	~~----~~	~~----~~	~~----~~	~~----~~	~~----~~

Instructions for Summary Exposure Pathway Evaluation Table:
1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated.'"
2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination.

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

☒ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

☐ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

☐ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code.

Rationale:

Groundwater

South Taylor

- Contamination above EPA screening levels remains in only six of the monitoring well locations, and in the leachate/seep collection stream (HWMH#1).
- Contaminated groundwater is confined to the area beneath the waste disposal areas (Wells A-5R, and B-13), or in the mine pool zone beneath the landfills (M-3R, M-5, M-6, and M-12).
- Three of the six wells (A-5R, M-5 andM-12) that continue to show contamination are part of the groundwater recovery system. The recovered groundwater is treated on-site.

Mid/North Taylor

- Ongoing groundwater contamination is not likely due to the nature of the waste, the length of time that has passed since the disposal activities ceased, and treatment of slag area seeps.
    - SVOC and PAH compounds – Low solubility and high soil adsorption gives low potential for contaminants to migrate to groundwater.
    - VOCs – Biodegradation over 35 years makes continued migration to the groundwater unlikely.
    - Metals – Water from the slag disposal area seeps is collected and treated prior to discharge through an NPDES outfall.

Groundwater beneath the site flows through mine-induced fractures (caused by mine subsidence) into the underlying mine workings (mine pool). Groundwater eventually discharges as acid-mine drainage seeps.

There are no public or private water supply wells within one mile of the site, based on a search of the PA GWIS data base (March 2014) and a residential property survey of nearby properties (July 2015).

Groundwater monitoring activities are performed by trained personnel in accordance with the health and safety procedures under the PADEP Solid Waste Permits.

Surface Soil and Subsurface Soil

Waste material at the South Taylor Area is contained under the landfill closure caps, thereby preventing exposure.

The Mid/North Taylor area – Uncontained waste is present at the Waste Tar Disposal Area and the Debris/Trash Disposal Area. Public access to the area is limited by fencing and locked gates. The area is not in active use for any purpose, therefore, worker are not at risk of exposure.

Surface Water

Only Manganese was detected above screening levels. The annual average concentration of 0.48 mg/l was marginally above the screening level of 0.43 mg/l at only one location, So uth Taylor tributary immediately upstream of the confluence with Streets Run (STT@SR). The annual average concentration in Streets Run, immediately downstream of the confluence, was below the screening level.

The screening level is established for a potable water supply. Pennsylvania does not have a manganese criteria for aquatic life uses. The South Taylor tributary is not used as a drinking water source. PADEP has listed South Taylor tributary, North Taylor tributary, and Streets Run as impaired waters due to metals from drainage from abandoned coal mines. PADEP removed the potable water supply designation from all surface water in the Streets Run watershed.

Reference:

Results of Investigation, Monitoring Well Evaluation Program Phase I, Hazardous Waste Landfill, South Taylor Environmental Park, Michael Baker International for United States Steel Corporation, January 2017

Results of Investigation, Monitoring Well Evaluation Program Phase I, Residual Waste Landfill, South Taylor Environmental Park, Michael Baker International for United States Steel Corporation, January 2017

South Taylor Environmental Park Technical Information Summary, Michael Baker International for United States Steel Corporation, July 2015

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[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

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4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

☐ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

☐ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

☐ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale:

Reference:

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

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5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

☐ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

☐ If no - (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

☐ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code.

Rationale and Reference(s):

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI (event code CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

☒ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the at the USS Taylor Facility, PAD 000 739 672, located at 555 Delwar Road, West Mifflin, PA 15122, under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

☐ NO - "Current Human Exposures" are NOT "Under Control."

☐ IN - More information is needed to make a determination.

Completed by _____ Date 3-6-2017
(print) Maureen Essenthier
(title) EPA/RCRA Project Manager

Supervisor _____ Date 3-13-2017
(print) Paul Gotthold
(title) Assoc. Dir., Office of PA Remediation
(EPA Region or State) EPA Region 3

Locations where References may be found:

US EPA Region III
Land and Chemicals Division
1650 Arch Street
Philadelphia, PA 19103

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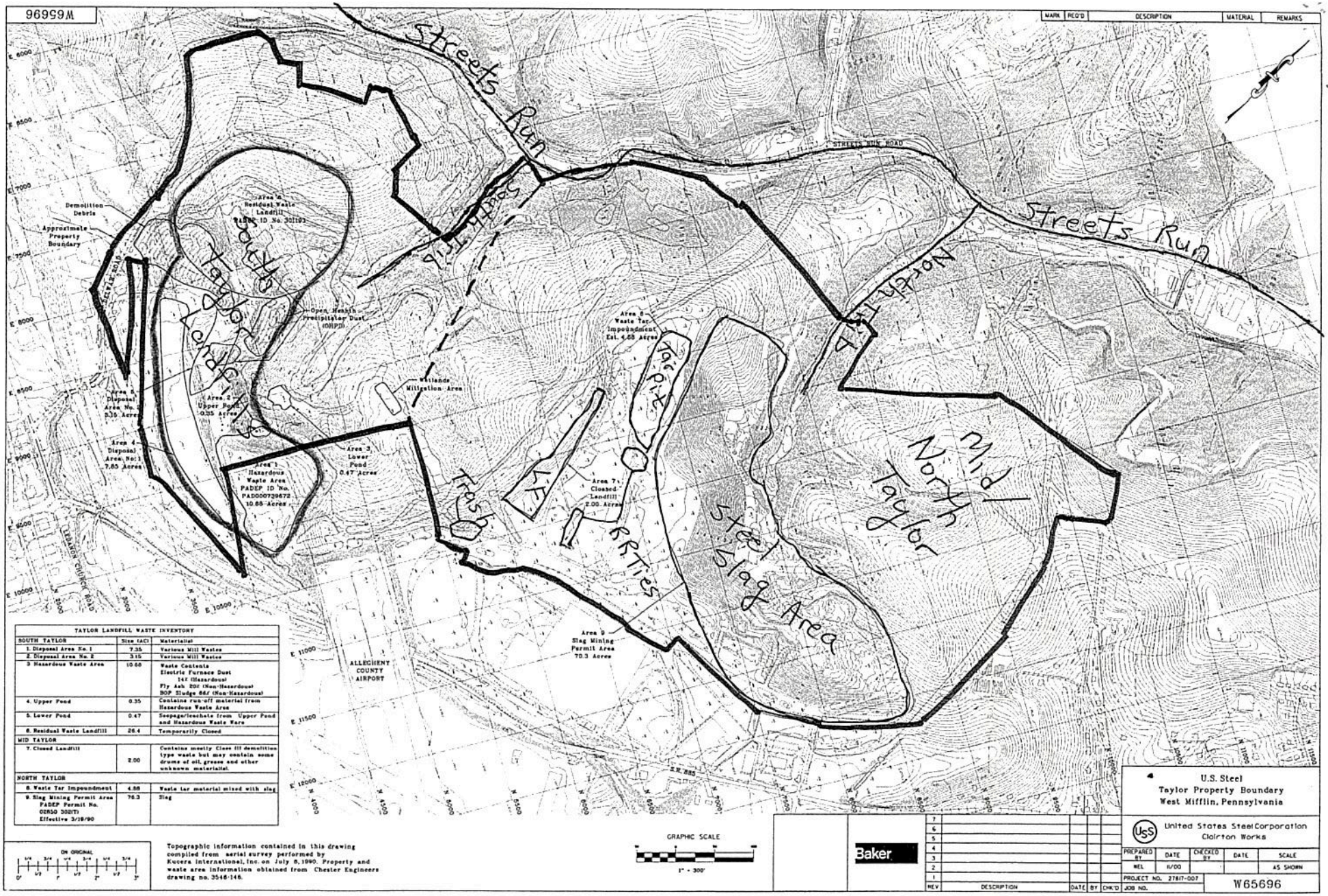
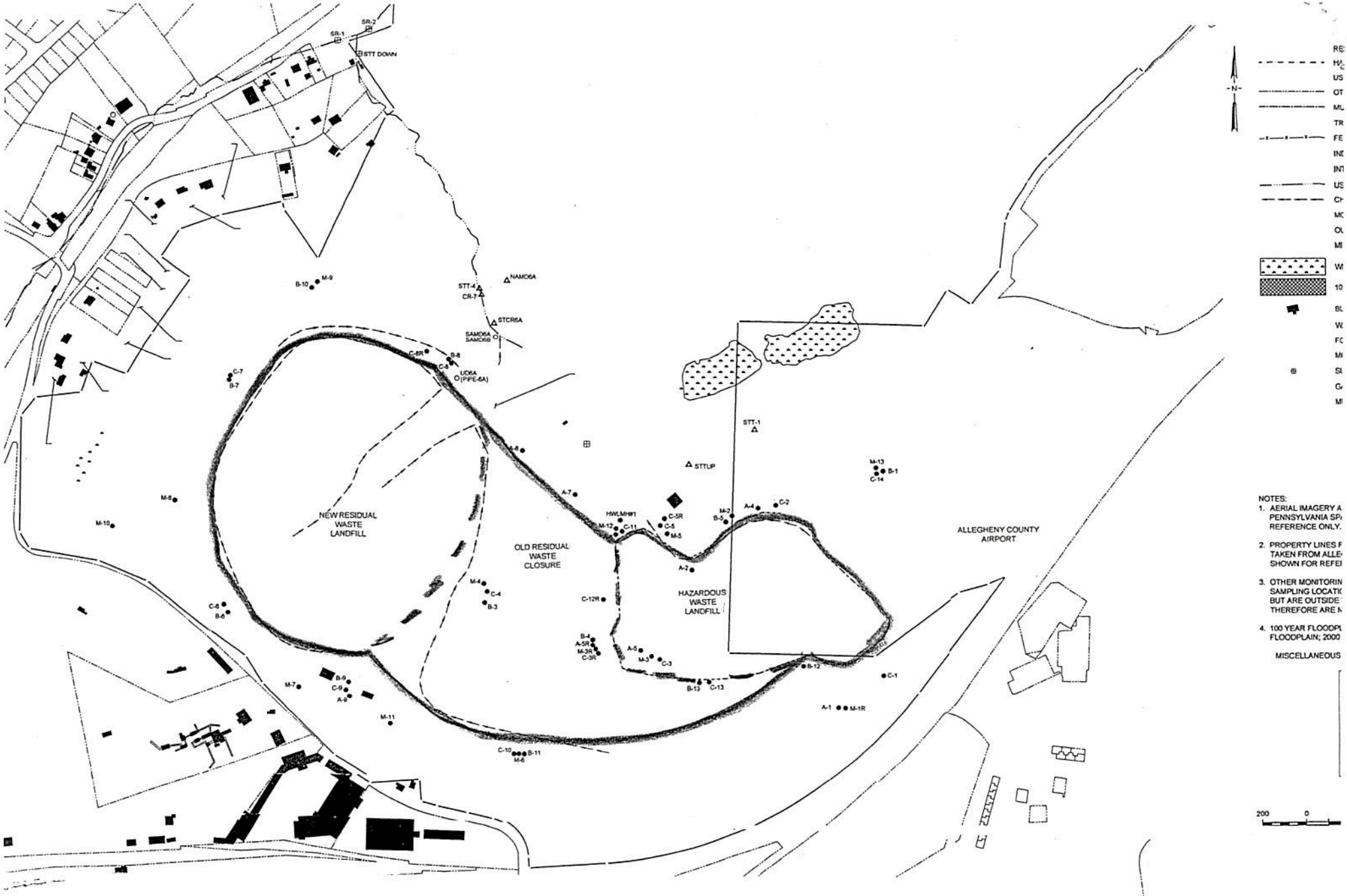


TAYLOR LANDFILL WASTE INVENTORY		
SOUTH TAYLOR	Size (AC)	Materials!
1. Disposal Area No. 1	7.35	Various Mill Wastes
2. Disposal Area No. 2	3.15	Various Mill Wastes
3. Hazardous Waste Area	10.68	Waste Contents Electric Furnace Dust 14% (Hazardous! Fly Ash 20% (Non-Hazardous! BOP Sludge 66% (Non-Hazardous!
4. Upper Pond	0.35	Contains run-off material from Hazardous Waste Area
5. Lower Pond	0.47	Seepage/leachate from Upper Pond and Hazardous Waste Area
6. Residual Waste Landfill	26.4	Temporarily Closed
MID TAYLOR		
7. Closed Landfill	2.00	Contains mostly Class III demolition type waste but may contain some drums of oil, grease and other unknown materials!
NORTH TAYLOR		
8. Waste Tar Impoundment	4.68	Waste tar material mixed with slag
9. Slag Mining Permit Area PADEP Permit No. 02850 302(T) Effective 3/18/90	76.3	Slag

Topographic information contained in this drawing compiled from aerial survey performed by Kucera International, Inc. on July 8, 1990. Property and waste area information obtained from Chester Engineers drawing no. 3548-146.

US STEEL TAYLOR FACILITY
Environmental Indicator (EI) RCRIS code (CA750)
Migration of Contaminated Groundwater Under Control

FIGURE 1



US STEEL TAYLOR FACILITY
Environmental Indicator (EI) RCRIS code (CA750)
Migration of Contaminated Groundwater Under Control
South Taylor Landfills

FIGURE 2

2016 Samples Exceed Screening Levels

RR 11/2